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DRAFT

ATTACHMENT B

DRAFT FIELD SAMPLING AND ANALYSIS PLAN FOR THE ENGINEERING EVALUATION/COST ANALYSIS WORK PLAN AVERY LANDING SITE AVERY, IDAHO

REVISION 2

Submitted to:

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LIST OF ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
AOC	Administrative Order on Consent
bgs	below grade surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	cubic feet per second
COPCs	contaminants of potential concern
DI	Deionized
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish and Wildlife Service
Golder	Golder Associates Inc.
HASP	Health and Safety Plan
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDW	investigative derived waste
IDWR	Idaho Department of Water Resources
LNAPL	light, non-aqueous phase liquids
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
Milwaukee Railroad	Chicago, Milwaukee, St. Paul and Pacific Railroad Company
µg/L	microgram per liter
NTU	nephelometric turbidity units
PAHs	polynucleated aromatic hydrocarbons
Potlatch	Potlatch Forest Corporation and Potlatch Corporation
PCBs	polychlorinated biphenyls
PQL	Practical Quantification Limit
QA	quality assurance
QP	quality procedures
QAPP	Quality Assurance Project Plan
RAO	removal action objectives
ROW	right-of-way
SAP	Field Sampling Analysis Plan
SDS	Sample Data Sheets
Site	Avery Landing Site, Avery Idaho
TP	technical procedures
VOC	volatile organic compounds
Work Plan	Engineering Evaluation/Cost Analysis Work Plan for the Avery Site

1.0 INTRODUCTION

Potlatch Land and Lumber, LLC (Potlatch) has entered into an Administrative Order on Consent (AOC) No 10-2008-0135 with the U.S. Environmental Protection Agency (EPA) to complete an engineering evaluation/cost analysis (EE/CA) for the Avery Landing Site (Site). The EE/CA will provide sufficient information on the source, nature, and extent of contamination, any human health and ecological risks presented by the Site, and recommended removal action alternatives appropriate for addressing the removal action objectives. This document is the Field Sampling and Analysis Plan (SAP) for conducting the EE/CA at the Site and is Attachment B of the EE/CA Work Plan. The SAP is supported by the Quality Assurance Project Plan (QAPP), provided as Appendix A to this report. The SAP describes or references the field procedures that will be used for the collection of data. Field procedures that are routinely used by Golder Associates Inc. (Golder) are standardized as Technical Procedures (TP) or Quality Procedures (QP) and will be provided if requested.

The statement of purpose and EE/CA objectives are outlined in Section 1 of the EE/CA Work Plan. The Site historical and background information are summarized in Section 2 and the physical setting in Section 3 of that document. This SAP provides guidance for the field tasks that will support the EE/CA scope of work presented in Section 5 of the Work Plan. The activities addressed in the scope of work in the Work Plan have been organized into field tasks to be conducted under this SAP.

The overall approach for the EE/CA is to assess the nature and extent of the contamination at the Site and to evaluate a limited number of removal action alternatives appropriate for addressing the contamination that has impacted soil, groundwater, and surface water. The EE/CA removal action evaluation will support the recommendation of a Non-Time Critical Removal Action that meets Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements. The EE/CA focuses on the protection of human health and the environment considering the direct exposure to shallow soils, protection of groundwater supplies, and protection of the St. Joe River.

1.1 Site Location

The Site is located along State Highway 50 about 0.75 miles west of the town of Avery, Idaho (Figure SAP-1). The Site boundary is shown on Figure SAP-2 and extends along the St. Joe River about 0.5 miles. The Site property is within the NW quarter of Section 15, Township 45North, Range 5 East and the NE quarter section of Section 16, Township 45 North, Range 5 East, Willamette Meridian. The approximate latitude is 47° 13’ 57’’ North and longitude is 11° 43’ 40’’ West.

Presently, there are four properties located on the Site: Highway 50 Property (owned by the Federal Highway Administration and the U.S. Forest Service); the Bentcik property; the Potlatch property; and the State of Idaho property (stream bed and banks of the St. Joe River as well as the Site groundwater). Several residents live on-Site year-round, and several more reside on the property seasonally. A domestic groundwater supply well is in the western portion of the Potlatch property for use by the residents and visitors. The eastern portion of the Potlatch property is vacant with numerous monitoring wells and piezometers that are used for monitoring groundwater. Access to the Site is unrestricted. The immediate area around the Site is residential and recreational. The St. Joe River is adjacent to the Site.

1.2 Background

The Site was used as a Chicago Milwaukee St. Paul Railroad (herein referred to as a Milwaukee Railroad) maintenance and fueling station from 1907 to 1977. In 1980, Potlatch acquired ownership of a portion of the Site and utilized it as a log landing and log storage area through the 1980s. Portions of the property were leased to third parties for a variety of uses such as log storage, material storage, parking, cabin sites and trailer sites (a number of which are still in effect). Historically, the Milwaukee Railroad had stored and handled petroleum products and hazardous substances on the Site.

As indicated in Section 2 of the Work Plan, investigations have been conducted onsite since the late 1980s. Removal actions have included impacted soil excavation, floating product capture trenches, and the installation of an impermeable vertical wall along the St. Joe River. In 1994, three separate floating product capture trenches were installed to intercept groundwater having floating petroleum products called Light Non-Aqueous Phase Liquids (LNAPLs). LNAPL was removed from the trenches using skimming-type pumps. The system operated from 1994 to 2000 and recovered approximately 1,290 gallons of oil. Golder understands that portions of the trenches became dry and failed to capture all floating LNAPLs, as witnessed by continued floating LNAPL discharges along river bank seeps. In 2000, an impermeable vertical wall was installed along the St. Joe River to prevent floating LNAPL from migrating to the river. The LNAPL was to be removed from capture wells located up-gradient of the barrier. This removal system appears to have worked for a number of years until seeps containing LNAPL oil were observed during river low flows in the fall of 2005. As a result, oil absorbent booms were placed in the river around the seeps. This SAP only addresses work to be completed under the tasks identified in the EE/CA Work Plan.

2.0 FIELD INVESTIGATION APPROACH AND TASK ASSIGNMENTS

2.1 Approach

The Site encompasses about 10 acres. The uses of the site include Highway 50 right-of-way, stream banks of the St. Joe River, and residences. A domestic water supply well is also on the property. All adjacent and surrounding properties are considered off-site areas in this SAP. A map of the location of the Site is illustrated in Figure SAP-1. Figure SAP-2 is a detailed project layout map of the Site.

In Section 4 of the Work Plan, information on the Site conditions and conceptual model is provided. The major issues and approach for the EE/CA are also presented Section 4 of the Work Plan. The SAP tasks that will generate data have been identified for the Site and are outlined below:

- **Phase I – Subsurface Soil Investigation** (TBD)
- Task 1: Additional Soil Sampling
- **Phase II – Groundwater Investigation** (TBD)
- Task 1: Additional Monitoring Well Installation
- Task 2: Groundwater Sampling
- Task 3: Groundwater hydraulic Gradient Investigation
- Task 4: Groundwater Pump Test
- **Phase II – Near Shore Investigation** (TBD
- Task 1: Near Shore Floating LNAPL Sampling
- Task 2: Near Shore Surface Water Sampling
- Task 3: Near Shore Sediment Sampling
- **EE/CA Evaluation & Reporting** (Project Team)

2.2 Task Assignments

The lead field personnel responsible for each task are identified in the above list of field tasks. Section 3 of this SAP describes each EE/CA field investigation task, identifies the media and sampling locations, provides the field procedures and defines the physical and chemical analyses that will be performed during this EE/CA. Each field leader will be responsible for the work being conducted in accordance with the Treatability Study Work Plan (Attachment A of the EE/CA Work Plan), this SAP (Attachment B of the EE/CA Work Plan), the QAPP (Appendix A of this SAP), the HASP (Attachment C of the EE/CA Work Plan), the Biological Assessment Work Plan (Attachment B of the EE/CA Work Plan), and the Cultural Resource Work Plan (Attachment E of the EE/CA Work Plan).

3.0 FIELD INVESTIGATION TASKS

This section describes the EE/CA field investigation tasks that will be conducted. The media and sampling locations are identified along with the procedures and nomenclature that will be used for sample acquisition and documentation. The QAPP (Appendix B of the SAP) and Golder Technical Procedures or the referenced sampling procedures shall be used in conjunction with this SAP for implementation of the EE/CA field tasks. Before any intrusive work is conducted within the Site boundary, the Site owners should be notified of the work schedule at least one week prior to mobilization. The location of the intrusive boring and the access route to each sampling location for drilling/sampling equipment must also be approved by Potlatch prior to mobilization.

3.1 Phase I – Subsurface Soil Investigation

3.1.1 Task 1 – Soil Sampling

Golder will collect subsurface soil samples from the western portion of the Site (west of current residential buildings) and from the area in the vicinity of the former 500,000 gallon fuel oil tank. The additional soil sample data will provide information on potential releases of petroleum products and hazardous materials to the western portion of the Site and to determine the northern and eastern extent of the contamination in the vicinity of the old fuel oil tank that is believed to be the source of released oil. Seven test pits will be excavated at locations shown on Figure SAP-3 in the western portion of the Site. The western soil samples will be obtained using an excavator to a depth of 10 to 12 feet below ground surface (bgs). If the excavator is not able to reach 10 to 12 feet bgs because the substrate encountered is too rocky, an air rotary drill rig will be used to collect the soil samples. Five air-rotary drill boreholes will be used to sample spoils in the vicinity of the former fuel oil tank as shown on Figure SAP-3. Two of the air-rotary borehole will be drilled at an angle to be able to inspect soils beneath Highway 50. During drilling, soil samples will be obtained at five-foot intervals and at the interface of the water table. The test pit and drilling activities will be subject to protocols and procedures specified in the relevant Golder Technical Procedures referenced below. These technical procedures will be provided upon request.

- TP 1.2-5 "Drilling, Sampling, and Logging Soils"
- TP 1.2-18 "Sampling Surface Soil for Chemical Analysis"
- TP 1.2-6 "Field Identification of Soil"
- TP 1.2-23 "Chain of Custody"

The Golder sample forms to be completed with these technical procedures are contained within the technical procedures.

3.1.1.1 Preparation activities

Preparation activities for this task include the following:

- Preparing bid package and contracting for certified excavation and drilling contractors;
- Coordination with the chemical analytical laboratory;
- Mobilizing necessary field equipment and supplies;

- Obtain necessary drilling permits and START Cards from Idaho Department of Water Resources (IDWR)for drilling boreholes to obtain soil samples; and
- Underground utility locating through public utility locate request.

Before all intrusive subsurface investigation activities, the Potlatch Site Manager shall be notified and a utility locate request will be filed with local utility organizations. All utilities located by the Utility Locating Services will be confirmed as clear before beginning subsurface excavation and drilling activities.

3.1.1.2 Soil Sampling

Excavation and drilling will be done on the Site by an Idaho licensed contractor and under the continuous supervision of a Golder field representative. Proposed test pit and soil borehole locations are presented in Figure SAP-3 and have been established in areas where investigative data is absent. At each test pit, soil samples will be collected from the surface, middle, and bottom depths. If soils are discolored, stained and appear impacted, a soil sample will be obtained representing the potentially impacted horizon as a substitute for the middle depth soil sample. During drilling, soil samples will be obtained using a 2.5-inch or larger diameter drive tube at every five-foot interval (starting at the surface) and at the interface of the water table. Soil samples will be logged and described in the field using the USCS classification.

3.1.1.3 Selection of Soil Samples for Chemical Analyses

The test pit spoils (or drilling drive samples will be inspected for indication of the presence of petroleum hydrocarbons based on field screening methods (i.e., visual signs, olfactory senses, and PID measurements). Soil samples will be placed in glass sample bottles that are appropriate for chemical analyses of the contaminants of potential concern (COPCs) as specified in the QAPP (see Appendix A). Table 4 of the QAPP lists the appropriate sample bottles for each analysis.

The Site COPCs and laboratory analytical methods that Test America Analytical Services are to use are as follows:

- Northwest Total Petroleum Hydrocarbons for diesel and extended range organics (NWTPH-Dx);
- EPA SW-846 methods for carcinogenic poly-aromatic hydrocarbon compounds and naphthalene (EPA 8270C);
- EPA SW-846 methods for polychlorinated biphenyls (EPA 8082) on surface samples at each sampling location;

All obtained soil samples will be sent to Test America Analytical Services laboratory in Spokane, Washington.

In an effort to minimize analytical expense while maximizing the soil data collection efforts, Golder will request that all soil samples from test pit excavations be analyzed for diesel/heavy oils, carcinogenic polyaromatic hydrocarbons (cPAHs) and naphthalene. Only the near surface soil samples will additionally be analyzed for polychlorinated biphenyls (PCBs). Golder will have the surface soil sample, the water table interface soil sample from each air-rotary borehole analyzed for diesel/heavy oils and cPAHs. The surface soils samples sampled from each borehole will also be analyzed for PCBs. Additional vadose zone soil samples will only be analyzed for diesel/heavy oils and cPAHs if the sample appears to be visually impacted by petroleum hydrocarbons.

The reference analytical methods and required laboratory PQLs are listed in the Table QAPP-4 of the QAPP (Appendix A of this Field Sampling and Analysis Plan).

3.1.1.4 Sample Nomenclature and Documentation

Documentation for sampling will include bottle labels, completion of Sample Integrity Data Sheets and Chain of Custody Records. Sample coolers will be secured with chain of custody seals. Each soil sample will have a unique identification number including Golder (G), the test pit number (i.e., TP2 for test pit # 2), the depth of the sample, and the sample collection date. An example of a soil test pit sample from soil test pit #2 that would be taken from the 10 foot depth on January 13, 2009 would be G-TP2-10-011309. Soil samples obtained from air rotary drilled boreholes will be identified replaced by the borehole number (ex. BH2 instead of TP2) and depth from surface for each soil sample.

3.1.1.5 Test Pit and borehole Backfilling

All test pits will be backfilled by a licensed excavation contractor with the soil that was removed from the test pit and marked with flush-mount steel plate (~1 to 2-inch diameter) identification markers flush with the ground surface. Boreholes will be backfilled with bentonite or bentonitic grout from the bottom of the borehole to land surface and marked with a flush-mount steel plate identification markers. These steel plate markers will be provided by the certified surveyor and labeled with the test pit identification number. Using this method, the test pit locations may be located in the future using GPS combined with metal detection methods. If boreholes are required to collect soil samples, then the boreholes will be backfilled by a certified drilling contractor with concrete. The boreholes will also be marked with a flush-mount steel plate as described above.

3.1.1.6 Surveying and Geodetic Control

The position of all test pits and boreholes is to be field-located and marked by Golder personnel in a manner that does not interfere with Site operations. Each test pit location will be marked with a flush-mounted steel plate marker that will be surveyed for horizontal coordinates (X and Y) using a differential Global Positioning System (GPS) by Golder field personnel.

3.2 Phase II – Groundwater Investigation

The hydrogeologic study will focus on the groundwater quality directly beneath the Site, and in particular the western portion of the Site where investigation data is absent. A number of monitoring wells installed by EPA and Potlatch currently exist on the eastern portion of the Site. Because no monitoring wells currently exist on the western portion of the Site, a total of four monitoring wells (designated GA-1 through GA-4) will be installed along the western half of the Site. Figure SAP-3 shows the proposed locations of new monitoring wells to be installed and sampled during the field investigation. Well GA-1 will be located between the St. Joe River and the existing monitoring well HC-1R, as shown on Figure SAP-3. Two wells (GA-2 and GA-3) will be located near the river within the western portion of Section 16 Area of the site where investigative data is absent. The fourth well (GA-4) will be installed hydraulically up-gradient (northeast) of the drinking water supply well (DW-01) for monitoring groundwater approaching the supply well (see Figure SAP-3). These additional monitoring wells together with well HC-1R will provide protective monitoring for Site COPCs in the groundwater migrating toward the residential groundwater supply well. The proposed location for GA-1 also provides information of the down-gradient extent of the floating LNAPL on the groundwater table. GA-2 and GA-3 monitoring wells will provide information on potential releases in the western portion of the Site. The monitoring wells will be drilled using air-rotary drilling techniques. The monitoring wells will be installed with screens traversing the anticipated water table fluctuations. After monitoring well installations are complete, the wells will be surveyed for geodetic x, y, z coordinates and water-level elevations measured to determine groundwater elevations. The new groundwater monitoring wells will also provide a determination of the local groundwater flow and gradient.

The numerous investigations conducted at the site to date determined the groundwater is between 10 and 16 feet bgs with water levels comparable with the St. Joe River surface water. The groundwater is flowing parallel to the river within the eastern portion of the Site (Section 15 Area). The groundwater flow pattern is also influenced from groundwater flowing southward from the mountainside. The Site groundwater appears to change direction and flow toward the southwest and toward the St. Joe River from commingling with mountainside groundwater in the middle portion of the Site (in the area around well HC-4 and around the boundary between Section 15 and 16 Areas). From the groundwater level and the river level measurements, groundwater appears to be discharging to the river within the western portion of the Section 15 Area and the eastern portion of the Section 16 Area. When operational, the private groundwater supply well may locally influence the groundwater flow pattern and discharge to the river.

The groundwater within the western portion of the site is derived from either direct infiltration of meteoric precipitation, from groundwater flowing from the east, or from groundwater flowing from the north. This additional groundwater investigation will help identify flow patterns in the western portion of the Site.

This task includes the anticipated sampling and analysis of groundwater by installing new monitoring wells and sampling existing monitoring wells located around the Site to collect additional groundwater quality data. Golder proposes to collect groundwater samples from the eight existing drinking water and groundwater monitoring wells.

The groundwater samples will be obtained during two sampling events. Analyses will be for standard field parameters and constituents of potential concern (COPC) at the Site.

3.2.1 Task 1 - Monitoring Well Drilling and Installation

Four groundwater monitoring wells will be drilled and installed on the western portion of the Site using air rotary methods. The monitoring wells will be located at the approximate locations shown on Figure SAP-3. The drilling installation and development of the monitoring wells will be subject to controls and strict quality assurance (QA) protocols and procedures specified in the relevant Golder Technical Procedures referenced below. These technical procedures will be provided if requested.

- TP 1.2-5 “Drilling, Sampling, and Logging Soils”
- TP 1.2-12 “Monitoring Well Drilling and Installation”
- TP 1.2-6 “Field Identification of Soil”
- TP 1.2-23 “Chain of Custody”

The Golder forms to be completed with these technical procedures are contained in the technical procedures.

3.2.1.1 Preparation Activities

Preparation activities for this task include the following:

- Preparing bid package and contracting for certified drilling contractors
- Coordination with the chemical analytical laboratory
- Mobilizing necessary field equipment and supplies
- Obtain necessary drilling permits and START Cards from IDWR
- Underground utility locating through public utility locate request

Before all intrusive subsurface investigation activities, the Potlatch Site Manager shall be notified of the drilling schedule and locations of the anticipated boreholes and a utility locate request will be filed with local utility organizations. All utilities located by the Utility Locating Services will be confirmed as clear before beginning subsurface drilling activities. If additional lines or obstructions are found during this task, subsurface boring locations will be adjusted appropriately to avoid encountering any and all underground utilities.

3.2.1.2 Borehole Drilling and Soil Sample Collection

Monitoring wells will be drilled and installed by a State of Idaho licensed driller using an air rotary drill rig. All drilling will be under continuous supervision of a Golder geologist/engineer.

Before arriving at the Site and before drilling each borehole (to prevent cross chemical contamination), the down hole equipment will be steam-cleaned using approved tap water source until no visible dirt remains. The monitoring well GA-1 will be the first drilled and installed well. This well air rotary borings will be advanced using nominal 6-inch ID rotary casing advanced continuously. Drilling will stop after penetrating 10 feet into the aquifer water table.

Soil cuttings will be collected for geologic logging at 5-foot intervals throughout the entire borehole and at the interface with the water table and logged by a Golder geologist/engineer in the field using Unified Soil Classification System (USCS) soil descriptions. Samples will only be collected and analyzed if field observations (i.e., visual signs, olfactory senses, and PID measurements) indicate impacted material. If impact is observed, the soil cutting samples will be transferred into glass sample bottles that are appropriate for chemical analyses of the contaminants of potential concern (COPCs) as specified in the QAPP (see Appendix A).

3.2.1.3 Chemical Analysis of Monitor Well Boring Soil Samples

Soil samples collected from the well borings to be analyzed will be sent to Test America Analytical Services laboratory in Spokane, Washington for analysis of the following COPCs in accordance with QAPP (Appendix A) requirements:

- Diesel and Heavy Oil Range Total Petroleum Hydrocarbons (NWTHP-Dx)
- PAHs – EPA Method 8270C
- Naphthalene – EPA Method 8270C
- PCBs – EPA Method 8082

The reference analytical methods and required laboratory practical quantification limits (PQLs) are listed in the Table QAPP-4 of the QAPP (Appendix A to this Field Sampling and Analysis Plan).

3.2.1.4 Sample Nomenclature

Documentation for sampling will include bottle labels, completion of Sample Integrity Data Sheets and Chain of Custody Records. Sample coolers will be secured with chain of custody seals. Each soil boring sample will have a unique identification number including Golder (G), the boring number (i.e., GA2 for monitoring well GA-2), the depth of the sample, and the sample collection date. An example of a soil boring sample from monitoring well GA-2 that would be taken from the 10 foot depth on January 13, 2009 would be G-GA2-10-011309.

3.2.1.5 Well Installation

All well installations will be under continuous supervision of a Golder geologist/engineer. The monitoring well borings will be advanced to a depth of approximately 10 feet below the top of the static groundwater table. Upon completing each of the borings to the desired depth, a monitoring well will be installed and registered in conformance with IDWR well construction regulations (IDAPA 37.03.09) and follow Golder Technical Procedure TP-1.2-12 “Monitoring Well Drilling and Installation”. A schematic installation diagram for the monitoring wells is shown in Figure SAP-4.

All wells will be completed with 2-inch diameter stainless-steel, wire-wrapped well screen and schedule-40 PVC casing with O-rings seal between joints. The well screens will be 15 feet in length and fabricated with 0.020-inch slots, or other appropriate slot size based on encountered formation materials. Shorter screen intervals may be used where appropriate based on lithologies encountered. The monitoring well screens will traverse the anticipated water table fluctuations. The screens will be installed to straddle the water table surface with 5 feet above and 10 feet below the static water level at the time of installation. The casing shall be centered in the hole and a bottom cap shall be attached to the end of the well casing.

Well installation will be conducted inside the drill borehole stabilization casing. A filter pack shall extend from about 6 inches below the well screen to no more than approximately 3 feet above the topmost slot on the well screen. The filter pack materials shall consist of clean, chemically inert, well sorted silica sand and shall be sized for the formation and the screen slot size. The annulus between the PVC well casing and the wall of the drill casing may be used for the placement of the sand filter during well construction. The drill casing will not be pulled above the depth of the materials placed. As it is being placed, the top of the filter pack will be measured with a weighted engineering tape. The sand pack will be surged (as part of well development to settle the sand before placing the bentonite seal).

After sand pack surging, 5 feet of bentonite pellets or chips will be placed in an unhydrated state immediately on top of the filter pack and subsequently hydrated. At least one hour will be allowed for the bentonite seal to hydrate before the remaining seal is placed. The remainder of the annular space shall be sealed using cement grout with 5 percent bentonite. The cement grout will be placed by injection from the bottom of the open annular space through a tremie pipe. Quick setting cement grout shall not be used as a borehole seal without the approval of the project manager. The top 4 to 5 feet will be filled with concrete as a base for the protective monument.

3.2.1.6 Well Monument Construction

All monitoring wells will be completed with a nominal 8-inch diameter protective steel well monument with a lockable lid. The monument will be flush mounted with the ground surface. At least a 6-inch clearance shall be maintained between the well cap and the monument lid to allow placement of a data logger, if needed.

The protective monument will be painted yellow and given the well designation. The well tag will be attached to the inside of the well monument lid. A 0.25-inch weep hole will be drilled at the base of the monument and the monument’s annulus filled with drainage sand or pea gravel. The wells will be capped using a plastic slip cap.

3.2.1.7 Well Development

Following installation of the groundwater monitoring wells, and after adequate time has elapsed for the grout to harden (minimum 24 hours), the monitoring wells shall be developed. Well development is performed to produce representative formation water that is free of drilling fluids, cutting, or other materials potentially introduced during drilling and well construction. Development shall be performed through a combination of surging and groundwater purging (via bailer or submersible pump). Representative water is assumed to have been obtained when pH, temperature, specific conductance and turbidity readings have stabilized (pH within 0.1 standard pH units, temperature within 0.5 degrees C, conductivity within 10 percent and turbidity within 0.5 nephelometric turbidity units (NTU) and below 2 NTU).

Groundwater produced during purging shall be captured in 55-gallon drums or suitable tank(s) and labeled as “investigative derived wastes” (IDW). Characterization of the water for disposal will be based on results of groundwater sample analysis. Additional IDW sampling may be required before disposal at a licensed Site. Golder will work with Potlatch to manage IDW and may be able to dispose of it during the remedial action, with IDEQ and EPA approval.

3.2.1.8 Well Drop Tube Installation

For wells where LNAPL is suspected to be present, a polyvinyl chloride (PVC, schedule 10) drop tube will be installed in each well. The drop tube will aid in groundwater sampling by protecting the sample collection tubing from LNAPL contamination. The PVC drop tube will be long enough to advance 1 foot below the water level (i.e. 1 foot below the bottom of the LNAPL layer). The bottom of the drop tube is sealed with a piece of tinfoil fixed to the tube by a hose clamp. A ½-inch stainless steel ball will be placed inside of the drop tube so that it rests on the tinfoil. Deionized (DI) water is slowly added to the drop tube until it has filled drop tube up to 1.25 feet from the bottom. The stainless steel ball and the water will cause the tinfoil to create a meniscus. The drop tube is then lowered into the well until the bottom of the drop tube is 1 foot below the water level. The tinfoil meniscus will prevent any LNAPL from entering the drop tube and will prevent LNAPL from adhering to the outside of the tinfoil. If the tinfoil was placed on the drop tube without the ball or DI water, there is the risk that the water pressure will dimple the tinfoil allowing LNAPL to pool inside of the dimple.

The drop tube will be held in place by a PVC plate (with a hole at its center) that is glued to the outside of the drop tube. The plate will then rest on the top of the well casing thereby suspending the drop tube inside the casing. The drop tube will remain in the well from one to three weeks until the water column has stabilized. A drop tube will be dedicated to each well that has floating LNAPL thereby reducing the risk of cross-contamination.

Before collecting a groundwater sample, the DI water must be removed from the drop tube using a peristaltic pump and ¼-inch HDPE tubing (to eliminate mixing of the DI water and groundwater). Once the DI water has been removed, the tinfoil will then be punctured with a stainless steel rod, causing the stainless steel ball to drop to the bottom of the well. A new piece of ¼-inch HDPE tubing with its end capped will be lowered inside of the drop tube to 1-foot below the bottom of the drop tube (approximately two feet below the water level). The cap will further prevent LNAPL from coming in contact with the sample tubing intake. Connect the ¼-inch tubing to a peristaltic pump and run the pump in reverse flow so that the air pressure blows the cap off of the tubing. Low-flow sampling can commence once the cap is off the tubing.

3.2.1.9 Monitoring Well Geodetic Survey

Following completion of the installation of monitoring wells, the wells will be geodetically surveyed. All new wells and existing monitoring wells that are used in the investigation will be surveyed by a certified surveyor using appropriate survey coordinate system. Surveying the wells will be conducted by a certified professional land surveyor licensed in the State of Idaho. Each monitoring well will be surveyed for geodetic X, Y and Z coordinates. Monitoring wells will have elevation (Z-coordinate) surveyed for:

- Ground surface elevation
- Top of monument elevation
- Top of PVC drop tube plate or PVC casing (if no drop tube is installed) at measuring point elevation
- Surface location in units of northings and eastings

All elevations on the wells will be surveyed to third order accuracy and precision. Elevation surveys will have an accuracy and precision of at least 0.02 foot for water elevation measurement. Surveys will reference the site-specific coordinate system used for previous investigations.

3.2.2 Task 2 - Groundwater Sampling

After development activities are completed and the aquifer has had at least one week to stabilize, groundwater samples will be collected. Two groundwater sampling events are proposed for EE/CA investigation to confirm analytical results. Groundwater samples will be collected from all the new groundwater monitoring wells (GA-1 through GA-4) and from existing wells DW-01, HC-1R, EMW-04, MW-11, EW-3, EMW-06, EW-4, and MW-5 (depicted on Figure SAP-3). The selected monitoring wells provide aerial coverage of the groundwater impacts on-Site.

Groundwater quality sampling activities will be conducted in accordance with protocols and procedures specified in the relevant Golder Technical Procedures referenced below. These technical procedures include the following, and will be provided if requested.

- TP-1.4-6a “Manual Water Level Measurements”
- TP-1.2-20 “Collection of Groundwater Quality Samples”
- TP-1.2-23, “Sample Handling, and Chain of Custody”

The Golder sample forms to be completed with these technical procedures are contained in the technical procedures.

Preparation activities for this task include:

- Requesting necessary field groundwater sampling equipment and supplies;
- Obtaining 55-gallon drums (or appropriate) for the collection of purge water; and
- Locating appropriate decontamination area at the Site.

3.2.2.1 Groundwater Sampling Activities

Sample collection and handling will be performed appropriately in accordance with the QAPP. All instruments used for field analysis will be calibrated in accordance with manufacturer’s recommendations. Chain of custody will be maintained appropriately by the field crew members.

Groundwater sampling activities from the monitoring wells will include the following activities:

- Inspection of each will for the presence of floating LNAPL
- Estimate the thickness of floating LNAPL, if present
- Measurement of static water levels
- Collection of floating LNAPL samples from MW-11 and HC-4
- Groundwater samples will be obtained using Low-Flow groundwater sampling techniques
- Measurement of field parameters (pH, specific conductance, temperature, dissolved oxygen, and turbidity) during purging with field sampling equipment
- Sampling of groundwater when the field parameters indicate that the well has been adequately purged

- Collection of representative groundwater samples in appropriate containers for COPCs
- Collection of a filtered groundwater sample for dissolved metals analysis
- Preservation and proper storage of each sample
- Collection of all purge water in appropriate containers for temporary on-site storage before disposal

Each well will be inspected for the presence of floating LNAPL using a product detecting meter. The static water level will be measured at all monitoring wells before initiating any groundwater purging activities. Monitoring wells with floating LNAPL will need to be sampled through a drop tube discussed in Section 3.2.1.8. All wells (with or without LNAPL) will be sampled using a peristaltic pump and HDPE ¼-inch tubing with a cap on one end. The cap will further prevent floating LNAPL or LNAPL sheen from contacting the sample tubing intake through carry-down. Connect the ¼-inch tubing to a peristaltic pump and run the pump in reverse flow so that the air pressure blows the cap off of the tubing. Low-flow sampling can commence once the cap is off the tubing.

The groundwater monitoring wells will be purged at a low-flow rate for sample acquisition, such that water table drawdown is less than 0.3 feet. Dedicated tubing will be used for each well. Intakes for the pump or sampling tube will be set at the center of the water column in the screened intervals, or two feet below the water level.

During well purging, field parameters pH, conductivity, turbidity, dissolved oxygen, and temperature will be measured every 5 minutes. The instruments used in the field parameter measurements will be field calibrated per the manufacturers' specifications and as described in the QAPP at the beginning of the day. Purging will be conducted until the measured rate of change of these parameters is in accordance with TP-1.2-20 on consecutive readings. Turbidity must be less than 5 NTU for the sample to be considered representative of groundwater conditions. All field parameter measurements and purge volumes will be recorded on Sample Integrity Data Sheets.

A filtered groundwater sample will also be collected from each well after the collection of unfiltered groundwater samples. The filtered sample will be collected using an inline 0.45 micron filter.

3.2.2.2 Floating LNAPL Sampling Activities

Floating LNAPL samples will be collected from MW-11 and HC-4. The floating LNAPL sample should be collected from the well after collecting a groundwater sample; however, no groundwater sampling will be conducted in HC-4. A new piece of HDPE ¼-inch tubing should be used to collect the LNAPL sample. The sample will be collected in appropriate sample containers and analyzed for all groundwater COPCs.

3.2.2.3 Sample Nomenclature

Documentation for sampling will include bottle labels, completion of Sample Integrity Data Sheets and Chain of Custody Records. Sample coolers will be secured with chain of custody seals. The Sample Integrity Data Sheet will be used to document sample collection information, as further described in the QAPP. A unique identification number shall be given to each groundwater sample that includes Golder (G), the well number (i.e., GA2 for monitoring well GA-2), and the sample collection date. An example of a groundwater sample from monitoring well GA-2 collected on January 13, 2009 would be G-GA2-011309. A floating LNAPL sample will additionally have the letters FP (Floating Product) behind the monitoring well number (i.e. G-MW11FP-011309).

3.2.2.4 Chemical Analysis of Groundwater Quality and LNAPL Samples

Groundwater COPCs have been determined and based on documented historical activities at the Site, known materials to be stored on the Site, and reported hazardous substances that were used at the Site. These COPCs are presented and discussed in the QAPP. Groundwater and LNAPL samples will be analyzed at Test America Analytical Services laboratory in Spokane, Washington for the following components:

- Diesel and Heavy Oil Range Total Petroleum Hydrocarbons (NWTHP-Dx)
- PAHs – EPA Method 8270C
- Naphthalene – EPA Method 8270C
- PCBs (only from GA-1, GA-2, and GA-3 wells and LNAPL samples) – EPA Method 8082
- Metals – EPA Method 6010C/0620A Series. Metals include arsenic, antimony, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

The reference analytical methods and required laboratory PQLs are listed in the Table QAPP-4 of the QAPP (Appendix A of this Field Sampling and Analysis Plan).

3.2.3 Task 3 - Groundwater Hydraulic Gradient Investigation

To better understand the flow of groundwater at the Site, monitoring wells will be monitored for groundwater level (elevation) changes. The St. Joe River is expected to influence the flow of Site groundwater based on antecedent infiltration and river stage. Elevation survey data for each existing monitoring well will be obtained from the EPA. The additional monitoring wells installed by Golder will be surveyed to the same datum as the other Site wells. The water levels in the wells will be monitored monthly, depending on weather conditions for access.

Water level monitoring will be compared to changes in the St. Joe River to better understand the influence various river stages have on Site groundwater flow patterns. A temporary staging station will be installed near the Site on the St. Joe River for measurements of river water levels. The upstream bridge at Avery, Idaho may be used to establish a temporary river stage station if one does not exist in the area. The water level data collected from the monitoring wells and the St. Joe River will be used to understand changes in groundwater flow patters during different seasons and during changes in the stage of the river.

Groundwater hydraulic gradient investigations will be conducted in accordance with protocols and procedures specified in the relevant Golder Technical Procedures. The technical procedure for this task includes TP-1.4-6A "Manual Water Level Measurements". The technical procedures will be provided if requested. The Golder sample forms to be completed with these technical procedures are contained in the technical procedures.

Groundwater hydraulic gradient investigation includes the following activities on a monthly basis:

- Requesting necessary field equipment and supplies prior to event
- Obtaining permission from adjacent property owners to collect groundwater levels from existing wells (if required) prior to event

- Inspection of each well for the presence of floating LNAPL
- Estimate the thickness of floating LNAPL, if present
- Measurement of static water levels in monitoring wells
- Measurement of river water level from either the upstream bridge at Avery, Idaho or a temporary staging station

Water levels in monitoring wells should be measured from the cleanest wells first. Decontamination of the water level meter should be conducted between each well.

3.2.4 Task 4 - Groundwater Hydraulic Tests

Short-term hydraulic slug tests will be performed on four selected monitoring wells (from the list of existing and new wells). The selection of wells for slug-testing will be based on well installation documentation, field inspections, and aerial representativeness. The need and implementability for a long-term pump test will be evaluated based on the results of the short-term slug-test.

If it is deemed necessary (based upon observed conditions in the monitoring wells), we may conduct a single well drawdown and recovery test. Water level fluctuations will be recorded using a down hole pressure transducer equipped with a data acquisition system.

The slug test investigation will be conducted in accordance with protocols and procedures specified in the relevant Golder Technical Procedures referenced below. These technical procedures include the following, and will be provided upon request:

- TP-1.2-17 Rising Head Slug Test
- TP-1.4-11 Single Borehole Drawdown and Recovery Pump Test

The Golder sample forms to be completed with these technical procedures are contained in the technical procedures.

Preparation activities for this task include:

- Reviewing existing monitoring well data;
- Requesting necessary field groundwater sampling equipment and supplies;
- Obtaining 55-gallon drums (or appropriate) for the collection of purge water; and
- Locating appropriate decontamination area at the Site.

3.3 Phase III – Near Shore Investigation

The St. Joe River LNAPL seep, surface water, and sediments will be sampled along the river embankment to assess discharges and impacts from the Site. The river stations are shown on Figure SAP-3. There are a total of eight near shore sampling locations labeled RS-1 through RS-8. RS-1 will represent up-river background for comparison to the remainder sampling locations. Only one sediment sampling event will take place. There will be two LNAPL and surface water sampling events that will coincide when LNAPL is visibly discharging along the river's edge during low river flows (typically summer and fall seasons). All of the river stations need to be marked by survey stakes (or similar) so that the river stations can be easily located over the course of sampling events.

3.3.1.1 Near Shore Sediment Sampling Activities

The near shore sediment investigation will be conducted in accordance with protocols and procedures specified in the relevant Golder Technical Procedures referenced below. These technical procedures include the following, and will be provided upon request:

- TP-1.2-24 Sediment Sampling
- TP-1.2-23, Sample Handling, and Chain of Custody

The Golder sample forms to be completed with these technical procedures are contained in the technical procedures.

Preparation activities for this task include:

- Coordination with the chemical analytical laboratory
- Mobilizing necessary field equipment and supplies

Two sediment samples will be collected from each river station. One sample will be collected at the shoreline (Right below the water line) and the second one will be collected approximately three to four feet from the shoreline (in the water). The banks of the St. Joe River are rip-rap lined, so the shoreline sediment sample will be collected as close to the waterline as practical, wherever the sediment has been deposited. The shoreline samples will be collected from the surface of the sediment (upper 3 inches) using a stainless steel spoon or trowel that will be decontaminated between each sample. The sediment will be transferred directly into a laboratory provided container.

The second sample (three to four feet from the shoreline) will be collected from the surface of the sediment (upper 3 inches) using a drive tube with a sand catching assembly. The drive tube with an extended handle will be driven into the sediment so that the upper 3 inches of surface sediment can be sampled. The sediment will either be directly placed in the laboratory provided container from the drive tube or a stainless steel spoon will be used to transfer the sediment from the drive tube into the sample jars. All sampling equipment will be decontaminated between each sample. An alternative sampling method to the drive tube would be a hand auger with an extended handle.

3.3.1.2 Near Shore LNAPL and Surface Water Sampling Activities

The near shore LNAPL and surface water investigation will be conducted in accordance with protocols and procedures specified in the relevant Golder Technical Procedures referenced below. These technical procedures include the following, and will be provided upon request:

- TP-1.2-26 Surface Water Sampling Methods
- TP-1.2-23 Sample Handling, and Chain of Custody

A Golder Technical Procedure does not exist for LNAPL sample collection. The Golder sample forms to be completed with these technical procedures and sampling efforts are contained in the technical procedures.

Preparation activities for this task include:

- Coordination with the chemical analytical laboratory;

- Mobilizing necessary field equipment and supplies.

Two LNAPL and surface water sampling events will occur. Each event will occur when LNAPL is visibly discharging along the river's edge during low river flows (typically summer and fall seasons). LNAPL will be collected from the surface water sampling stations along the river bank, if any LNAPL is present. Golder will obtain a sample of LNAPL that accumulates behind the oil floatation booms adjacent to a river sampling station by carefully skimming the LNAPL directly into laboratory provided clean sample vials. The laboratory will be instructed to use only the LNAPL for sample analysis.

Surface water samples will be collected from the eight river stations depicted in Figure SAP-3 (the same locations where the sediment samples were collected). Surface water samples will be obtained below the river water surface from about the mid-depth. Since the surface water samples are to be obtained adjacent to the river's edge (~ 1 foot from the shore), the depth of the river is expected to be very shallow. Therefore, depth discreet surface water samples will not be necessary. Unfiltered surface water grab samples will be collected directly from the river if there is no visible floating LNAPL present at a specific sampling station either by filling laboratory provided sample containers directly (if there is not an acid preservative in the sample container) or by using a laboratory cleaned glass cup, the contents of which would then be transferred into the laboratory provided containers. Sampling surface water below a floating LNAPL will be conducted by lowering a dedicated HDPE ¼-inch tubing to a peristaltic pump with a plastic cap below the LNAPL layer. The cap will be blown off the sampling tube by reversing the air flow with the pump. The sample will then be obtained by pumping surface water with the peristaltic pump directly into the sampling containers with appropriate preservatives.

Filtered surface water samples will also be collected at each river station by using dedicated HDPE ¼-inch tubing, a dedicated 0.45-micron filter, and a peristaltic pump by filtering water pumped directly out of the surface water body into laboratory provided containers with appropriate preservatives.

Water quality parameters (temperature, pH, conductivity, dissolved oxygen, and turbidity) will also be monitored at each river station where a sample is collected. The water quality parameters will be recorded on a Sample Integrity Data Sheet.

3.3.1.3 Sample Nomenclature

Documentation for sampling will include bottle labels, completion of Sample Integrity Data Sheets and Chain of Custody Records. Sample coolers will be secured with chain of custody seals. The Sample Integrity Data Sheet will be used to document sample collection information, as further described in the QAPP. A unique identification number shall be given to each sediment, LNAPL, and surface water sample that includes Golder (G), the river station number (i.e., RS2 for river station number RS-2), the type of sample it is (SED for sediment, FP for LNAPL/floating product, and SW for surface water), sediment sample location from the shoreline (for sediment samples only- 0 for shoreline samples and 3 for samples collected 3 feet from the shoreline), and the sample collection date.

An example of a sediment sample from river station RS-2 collected at 3 feet from the shoreline on January 13, 2009 would be G-RS2SED-3-011309. A floating LNAPL sample will additionally have the letters FP (Floating Product) behind the monitoring well number (i.e. G-MW11FP-011309). A surface water sample collected from river station RS-2 collected on January 13, 2009 would be G-RS2SF-011309.

3.3.1.4 Chemical Analysis of Sediment, Surface Water and LNAPL Samples

Sediment, LNAPL, and surface water COPCs have been determined and based on documented historical activities at the Site, known materials to be stored on the Site, and reported hazardous substances that were used at the Site. These COPCs are presented and discussed in the QAPP. Sediment, LNAPL, and surface water will be analyzed at Test America Analytical Services laboratory in Spokane, Washington for the following components:

- Diesel and Heavy Oil Range Total Petroleum Hydrocarbons (NWTHP-Dx)
- PAHs – EPA Method 8270C
- Naphthalene – EPA Method 8270C
- PCBs – EPA Method 8082
- Metals (only for LNAPL samples) – EPA Method 6010C/0620A Series. Metals include arsenic, antimony, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

The reference analytical methods and required laboratory PQLs are listed in the Table QAPP-4 of the QAPP (Appendix A to this Field Sampling and Analysis Plan).

4.0 FIELD INVESTIGATION SUPPORTING PROCEDURES

The preceding section identified those tasks that will be completed to fulfill the requirements of the EE/CA. The following section provides the procedures required to support the EE/CA tasks.

4.1 Field Health and Safety

A Site specific Health and Safety Plan for EE/CA investigations are provided in Attachment C to the Avery Landing EE/CA Work Plan. Key elements of on-Site safety will be communicated to the field personnel, including personal protective measures and equipment, emergency preparedness, and incident protocol. Due to the remoteness of the Site, the Health and Safety Officer will also ensure adequate communication equipment is available to field personnel for contact in the case of field emergencies. The Health and Safety Plan will be reviewed by all field personnel and a tailgate health and safety meeting will be conducted at the beginning of each day. The Health and Safety Plan will be kept with field personnel on-Site at all times.

4.2 Field Quality Control Samples

All field QC procedures, field and laboratory QC samples, and laboratory analytical methods to be used during the EE/CA investigations are provided in the Avery Landing Quality Assurance Project Plan (QAPP) in Appendix A to this Field Sampling Plan. The primary laboratory for analysis of samples is Test America in Spokane, Washington. Split samples will be sent to OnSite Environmental in Redmond, Washington for analysis.

4.3 Sample Handling, Sample Shipment and Sample Custody

This section provides details on sample handling, shipment, and custody.

4.3.1 Sample Handling

All samples will be placed into appropriate containers as indicated in Tables QAPP-3 and QAPP-4 of the QAPP (Appendix A). All sample containers will be supplied by the project analytical laboratory.

As discussed previously, each sample will be assigned a unique identification number, which will be used on chain of custody sheets, sample labels, and field logbooks for identification and tracking purposes and for use in the project database. The samples will be labeled immediately after collection in the field with the sample identification number, location, depth, date and time of sample collection, and any special handling instructions.

All samples will be placed on ice in a cooler immediately after collection and during shipment to the laboratory. While awaiting shipment, samples will be stored temporarily in a secured area under custody by the sampler. All samples will be shipped in sealed ice chests with leak-proof ice-filled bags sufficient to maintain a temperature of approximately 4°C for 48 hours. Custody seals will be placed on each cooler or package of samples. Packing material will be used to prevent breakage and shifting of sample containers during shipping.

4.3.2 Sample Shipment

Samples will be transported to the analytical laboratory by common overnight express carrier or hand delivered. Samples will be shipped no later than five days following collection. The analytical laboratory will be notified of each sample shipment when samples are shipped. Documentation that samples were received by the analytical laboratory shall be obtained via fax or email the day of arrival at the laboratory.

4.3.3 Sample Custody

Chain of custody documentation will be maintained for each sample collected. The chain of custody form will provide an accurate written record verifying that the samples were under appropriate custody at all times before arrival at the laboratory. Chain of custody will be conducted in accordance with Golder Technical Procedure TP 1.2-23 “Chain of Custody”.

The chain of custody will be signed by each individual who has possession of the samples until they are delivered to the laboratory. A copy of the chain of custody will be retained for record management purposes. Each form will be placed in a water-tight plastic bag taped to the underside of the lid of the cooler containing the samples designated on the form. Coolers will be sealed with custody seals. Upon arrival at the laboratory, samples will be received and inspected by a laboratory representative. Samples contained in the shipment will be compared to the chain of custody to ensure that all samples were received and that analytical instructions are clear. The laboratory shall then provide confirmation to field personnel via fax that the samples were received.

4.4 Documentation Requirements and Record Management

All data collection and relevant field activities overseen by each field individual shall be documented in chronological order in a controlled permanently bound field logbook. Each logbook will be labeled with the project specific job number, project title, and sampling individual’s name. All entries into the logbook will be made using blue or black permanent ink. Entries shall be legible, complete, and accurate. Sufficient information will to be recorded to allow the reconstruction of events based on entries without the reliance on personal recollections. Corrections will be made by drawing a single line through the revised text and initialing and dating the correction. Each page in the logbook will be signed and dated by the person responsible for the day’s entries.

The information recorded in the logbook will include, but not be limited to, the following:

- Date of field activity
- Weather conditions
- Names of personnel present and activities being conducted
- Start and finish times of individual activities
- Descriptions of sample locations
- Descriptions of samples collected and time
- Relevant conversations

All samples will be recorded on Sample Data Sheets (SDS). The Sample Data Sheets will be kept in a 3-ring binder logbook maintained at the field Site. Sample Identification Numbers will be pre-printed and placed in the logbook for assignment to individual samples as they are collected. The logbook will be maintained by sample collection personnel onsite.

4.5 Decontamination of Drilling and Sampling Equipment

All direct sampling equipment (not including drill rods) will be decontaminated before the start of sampling activities and between each use. The sampling equipment will be washed with a nonphosphate detergent (Alconox or equivalent) solution using brushes to remove all visible dirt and grit. A tap or approved water rinse will be used to thoroughly remove all detergent solution followed by a rinse with dilute hydrochloric or acetic acid. The final rinse will be distilled/deionized water. Should soil or other visible matter remain on the sampling equipment after the detergent/water wash, a wet tap water towel will be used to remove material and the full-complement of decontamination procedures repeated. If the material cannot be removed, the equipment will be retired and not used again. All decontamination rinsates produced during sampling will be collected in suitable containers for temporary on-site storage. The results of the soil sampling and analysis will be used to determine appropriate means of decontamination rinsate disposal. The decontamination rinsates will be disposed of in accordance with all applicable regulatory requirements. Further details on decontamination are provided in the QAPP (Appendix A).

Drill rods shall be either steam cleaned or hand brushed cleaned with tap water or with an approved water source until all dirt is removed.

4.6 Investigative Derived Waste

Investigation derived waste (IDW) will be generated on the Site during test pitting, well drilling, and well purging. All borehole waste cuttings will be containerized onsite during drilling activities as they are generated. Each container (likely a 55-gallon drum) will identify the specific borehole, from which the waste soils were derived, on its label. Soil cuttings will be monitored in the field using visual indicators, olfactory screening, and PID measurement techniques to indicate the presence of possible hazardous substances contained in the waste cuttings. Any waste cuttings determined or suspected to contain hazardous substances will remain containerized and will be disposed of as "investigative derived wastes" at an appropriate disposal Site. Laboratory analytical results will help determine the appropriate disposal method. If analytical results indicate that borehole waste cuttings do not contain hazardous substances, those containers will be declared as clean and will be emptied in an appropriate area on-Site.

Purge water associated with monitoring well installation and development will be contained and segregated in 55-gallon sealed drums (Type 17H) and stored on the Site at a remote location before off-site disposal. The drums will be labeled as outlined in the QAPP (see Appendix A). Groundwater quality data for each well will be used to characterize the purge water for proper disposal.

Used protective clothing, gloves, etc. will also be managed on the Site according to IDEQ requirements. These will be placed in 55-gallon labeled drums, stored adjacent to the purge water drums, and disposed of at a later date according to its chemical characteristics. Additional IDW sampling may be required before disposal of IDW at a licensed Site. Golder will work with Potlatch to manage IDW and may be able to dispose of it during the remedial action, with EPA approval.

5.0 BIBIOGRAPHY

EPA (United States Environmental Protection Agency). 1994a. Soil Sampling. Standard Operating Procedure #2012. U.S. Environmental Protection Agency. Environmental Response Team. Available from: http://www.ert.org/media_resrcs/media_resrcs.asp

EPA (United States Environmental Protection Agency). 1994b. General Field Sampling Guidelines. Standard Operating Procedure #2001. U.S. Environmental Protection Agency. Environmental Response Team. Available from: http://www.ert.org/media_resrcs/media_resrcs.asp

FIGURES

Source: Ecology and Environment, Inc., 2007

FIGURE **SAP-1**

SITE LOCATION MAP

EE/CA WORK PLAN AVERY LANDING SITE/WA

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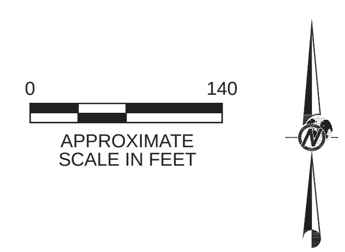
Golder Associates



LEGEND

- Property Line & Section 16-15 Division Line
- Site Boundary

FIGURE **SAP-2**
SITE LAYOUT MAP
EE/CA WORK PLAN AVERY LANDING SITE/WA

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LEGEND

Property Line & Section 16-15 Division Line	Surface Water Sample Location
Site Boundary	Proposed EE/CA Monitoring Well
EPA Monitoring Well	Proposed River Sediment and Floating LNAPL and Surface Water Sampling Location
EPA Soil Boring	Proposed Test Pits for Soil Sampling
Monitoring Well	Proposed Borehole for Soil Sampling
Domestic Well	Proposed Angled Borehole for Soil Sampling

0 140
APPROXIMATE SCALE IN FEET

FIGURE **SAP-3**

EE/CA INVESTIGATION SAMPLING LOCATIONS

EE/CA WORK PLAN AVERY LANDING SITE/WA

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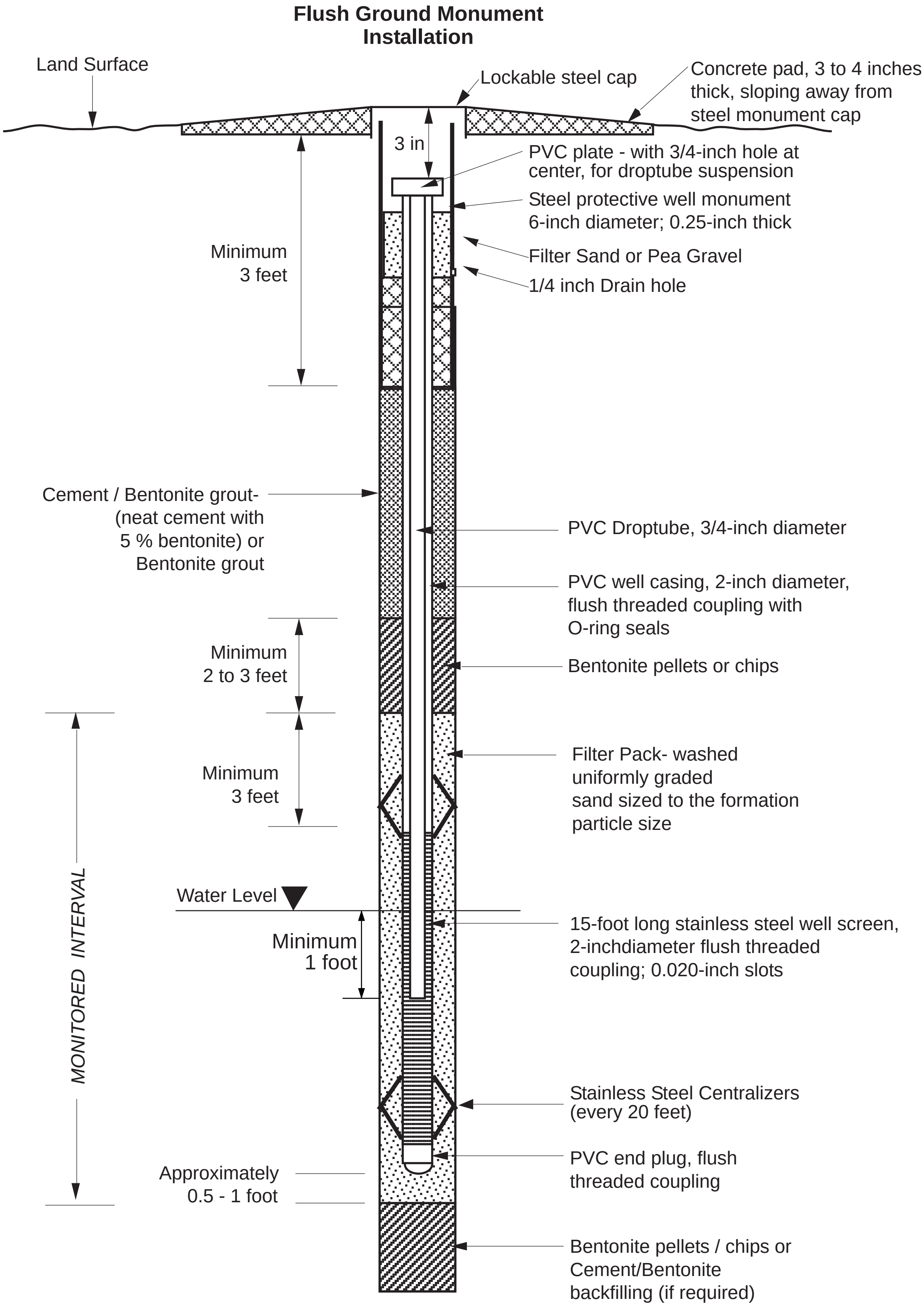

NOT TO SCALE

FIGURE **SAP-4**
SCHEMATIC MONITORING WELL INSTALLATION DIAGRAM
EE/CA WORK PLAN AVERY LANDING SITE/WA

APPENDIX A

QUALITY ASSURANCE PROJECT PLAN